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SUBMISSION OF THE CITY OF HAMILTON

TO THE

GREAT LAKES/SEAWAY TASK FORCE

TUESDAY, AUGUST 12, 1980

The City of Hamilton and the Regional Municipality of Hamilton-Wentworth, composed of Hamilton and the communities of Stoney Creek, Dundas, Glanbrook, Flamborough and Ancaster are vitally concerned with the economic well-being of the St. Lawrence Seaway, the Great Lakes System in general and with the Port of Hamilton specifically. We appreciate the opportunity to place our concerns before your Task Force Mr. Chairman, and ask for your indulgence, as our Brief, though concise, is rather long in comparison to many that you have had the pleasure of hearing.

BACKGROUND:

The Port of Hamilton:

Position : 43 degrees 16' north latitude; 70 degrees 52' west longitude
Annual Tonnage : approaching 15 million
Maximum Vessel Size: 730 feet by 75 feet with a 26-foot, six-inch draft
Berthing Space: a. Hamilton Harbour Commission, 19,000 feet
b. Private docks, 10,000 feet
Storage: covered, 638,000 sq. ft.; outside, almost 3,000,000 square feet
Servicing: CNR, CP Rail, T.H. & B. railways, numerous truck lines;
Hamilton Civic Airport
Dimensions: approximately four miles long and up to three and a half miles wide
Shipping Season: April 15th to December 15th (generally)
Annual Approximate Volume of Ships: 900, with 22,000 officers and crew members.

Hamilton is about 1,920 kilometres (1,200 miles) from the Atlantic Ocean, yet it has one of the busiest and most extensive harbours in all of Canada. The diverse factors that contribute to the region's economy are firmly stitched together by the natural and man-made characteristics of this harbour. It is a multifaceted jewel in the Steel City's crown and is linked to the world by the St. Lawrence Seaway.

The Hamilton Harbour Commission, founded in 1912, has fostered an agressive policy of creating new and modern facilities; as an understandable consequence; its business - both in terms of dollars and volume - has steadily escalated. Incoming cargoes from other Great Lakes Ports and the harbours of the world feed the voracious appetites of commerce and industry. These cargoes include iron ore and coal for the steel furnaces of Hamilton. Outgoing tonnage represents semi-finished and finished products for the world at large.

Far from being merely the domain of lake freighters and ocean-going vessels, the harbour represents a large but sheltered recreation area which is the justifiable pride of sailors and power boaters. The Harbour Commission, the cities of Hamilton and adjacent Burlington, and private industry all are working together to create green space around portions of the harbour's perimeter where it can be enjoyed by non-boaters.

The harbour goes by several other names and it is sometimes arguable whether its true name is Hamilton Harbour or Burlington Bay. Local folk opt for brevity and simply call it "the Bay" or "the Harbour". It is oval in shape and virtually landlocked. Entry is gained by a wide, deep canal linking it to Lake Ontario. It is sealed off from the lake and protected from it by a narrow strip of land. Plans are now well along for the conversion of this sandy beach strip from a residential development to public parkland.

The ongoing effort to attract added cargoes, together with ever-changing cargo-handling techniques, have made it imperative for the Hamilton Harbour Commission to plan and install new facilities. A redevelopment project is currently under way to add another 2,100 feet of berthage and open pier space to handle dry and liquid bulk commodities and steel products. (Bulk commodities provide the majority of both incoming and outgoing cargoes.)

Because of the number of ships calling at Hamilton, there has been a parallel development of businesses catering to the vessels and their crews; ship chandlers, marine engineering firms, stevedoring companies and other ancillary services. Partly because of them and partly because of the secure berthing the harbour provides, 20 or more lake freighters anchor here for the winter lay-up. The harbour is capable of accommodating the largest vessels that navigate the St. Lawrence Seaway.

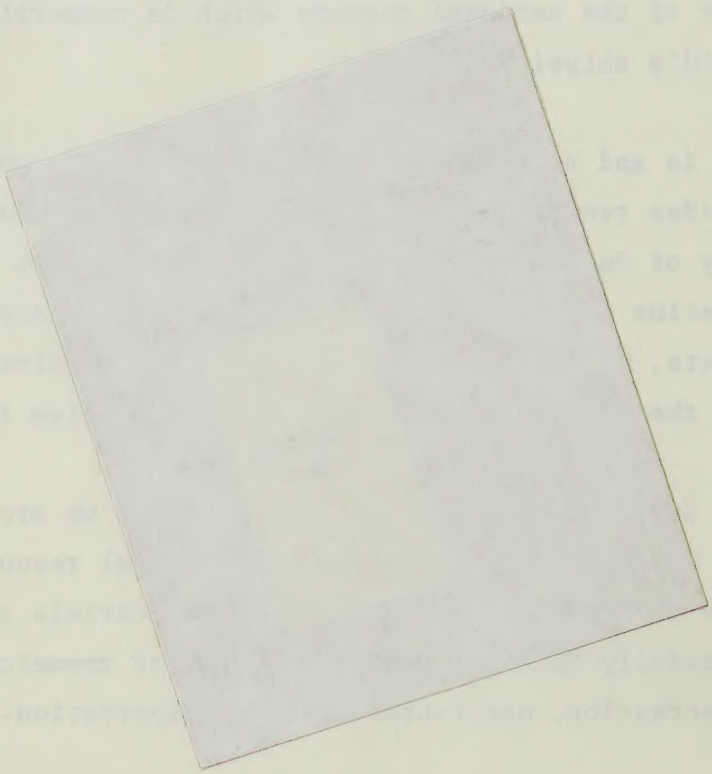
ANALYSIS:

Major Areas of Concern:

1. The Seaway is a natural resource of unparalleled economic importance to the Province of Ontario, Canada and most importantly, the Port of Hamilton and the surrounding municipalities. For a variety of reasons the seaway has become a coastal or domestic waterway rather than a major asset of the national economy which is commercially attractive to the world's shipping.

2. The Seaway is and has become a major recreational and tourism facility which provides tens of millions of tourism and recreational dollars to the economy of Ontario each year. Thousands of jobs in such diverse areas as marine operation, boat tour operators, manufacturing (fishing tackle, boats, motors, etc.) are created or maintained annually through the use of the seaway as a recreational and tourism facility.

3. The Seaway is environmentally sensitive and if we are to encourage the use of the Seaway as a tourism and recreational resource as well as a major route for the moving of people, raw materials and finished goods, we must carefully balance the requirements of commerce be they from tourism, recreation, manufacturing or transportation. (See Schedule A).

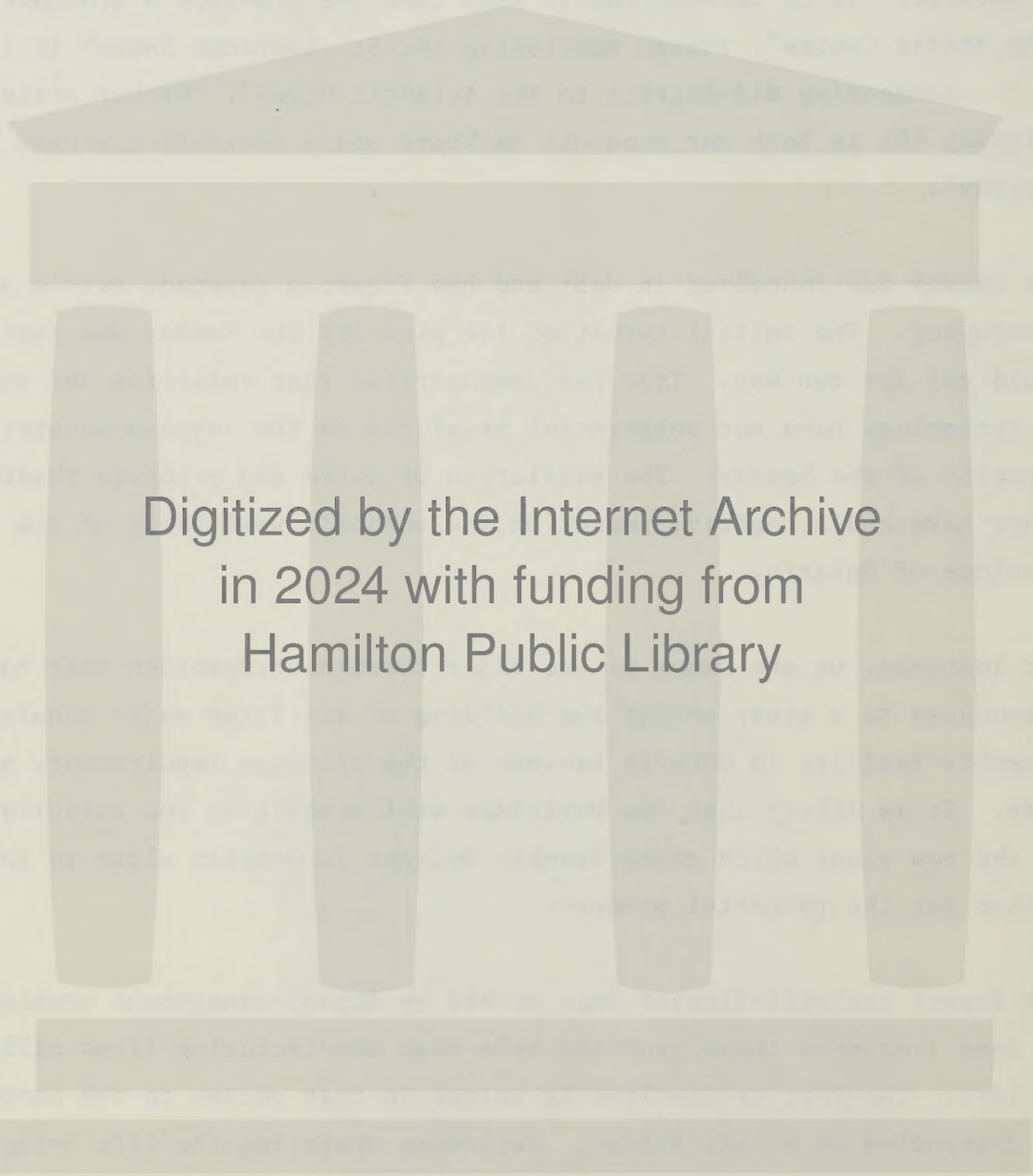


4. The Seaway is a major economic factor in the economy of the Province of Ontario and yet litle or no marketing of the Seaway as a route for the transportation of goods or service has been undertaken by the Province of Ontario. It is interesting to note that the Province's brochure, "The Profit Centre", though mentioning the St. Lawrence Seaway in terms of "...connecting mid-America to the Atlantic Ocean", further states "Highway 401 is both our economic backbone and a controlled access freeway".

5. The Seaway was conceived in debt and has fought a constant battle against bankruptcy. The initial thrust of the plan for the Seaway was that it would pay its own way. Time has demonstrated that inflation and shifts in technology have put substantial pressures on the revenue-generating capacity of the Seaway. The escalation of tolls and pilotage requirements have had a negative impact on the economic well-being of the Province of Ontario.

   For instance, we are aware of one major foreign corporation that has discounted to a great extent the building of its first major manufacturing assembly facility in Ontario because of the pilotage requirements and cost. It is likely that the Maritimes will benefit by the establishment of the new plant which quite frankly belongs in Ontario close to the market for the potential product.

6. The Seaway has periodically been marked by labour-management problems. In some instances these problems have cost manufacturing firms millions of dollars. The Port of Hamilton is unique in that access to the Harbour is controlled by a lift bridge. Employees operating the lift bridge belong to a Federal Government Union and, in fact, the Port of Hamilton is the only port on the Great Lakes that can be totally closed down by a labour action.



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7. The Seaway is the most energy-efficient means of moving all forms of cargo between Canadian locations, American locations and foreign locations. Many studies have been undertaken and we assume that the Seaway Task Force has access to the information which conclusively proves that water transportation is the most energy-efficient means available for moving goods and people. (See Schedule A).

   In conjunction with rail and trucking, the Seaway provides an integrated network which is matched in few other countries around the world. Thus it is extremely important that easy rapid access be provided between rail, road and water transportation. Any student of tariffs will note that some unique tariffs exist which highly favour the tidal ports of Montreal and the East. These ports are treated as export gateways whereas the six inland deep water ports are not given these tariff rates.

8. The Seaway provides a unique opportunity both for the building of new ships and for the repair of ships using the Seaway. Thousands of jobs are created or maintained annually in the construction or repair of ships using the Seaway. Hundreds more jobs are created or maintained in the steel industry and associated light and heavy manufacturing industries across the Province of Ontario.

9. The Seaway normally closes for the season on or about December 15 each year. It has been proven in the upper Seaway that year round operation, subject to closedowns of six weeks for maintenance, is feasible and indeed economically desireable.

10. Seaway Ports such as Hamilton have a unique concern in the areas of assessment as it relates to docks. The docks are assessed as improvements rather than being considered in the same light as roads or highways.

RECOMMENDATIONS:

1. That the Province of Ontario, through its appropriate Ministries, undertake an aggressive marketing program stressing the advantages of using the Seaway and the deep water ports in the Province of Ontario.

2. That an examination of existing legislation be undertaken with a view toward rationalizing the various Federal, Provincial and Municipal laws which impact on Recreation, Tourism and Manufacturing in Seaway and Port related areas.

3. That Pilotage requirements be re-examined and that properly qualified captains be allowed to proceed through areas of the Seaway where their experience warrants.

4. That the Province broaden their Terms of Reference relating to funds available for economic development in the areas of tourism, with special regard to areas that currently have a heavy emphasis on manufacturing in order to expand the economic base of such areas. (Hamilton, Windsor, etc.).

5. That the shipping season be extended to a year round operation.

6. That close co-operation between labour and management be encouraged and that the employees operating the lift bridge at the entrance to the Harbour become employees of the Hamilton Harbour Commission.

7. That special rate structures provided by railways and trucking should, by legislation, recognize the Ports of Hamilton, Toronto, etc., on the same basis as Montreal and Halifax are recognized.

8. That passenger service by water transport be examined, particularly between Hamilton, Oakville, Port Credit, Toronto, Whitby and Oshawa.

9. That the question of taxation and assessment be reviewed and defined by the Province as relating to dock structures.

10. That the Province support the continuance of ship building subsidies in order to provide markets for steel and encourage the creation of a Canadian Merchant Marine.

11. That the concept of coastal licensing be re-examined.

12. That the Province accelerate plans for the twinning of the Burlington Bay Skyway Bridge and that the Province fund a perimeter road linking the bay-front industrial core with Highway 403.

The St. Lawrence Seaway, The Quiet, Efficient Marine Highway

This report was prepared by Ken Gilbert, projects director with the Toronto Harbour Commissioners, a member of the engineering committee of the International Association of Great Lakes Ports, and was presented at the annual meeting held on June 22, 1972.

At the last general meeting of this association, held on January 20, 1972, Mr. J. H. Jones, Chairman of the Engineering Committee, proposed that the Engineering Committee should carry out a comparative study to determine the amount of noise and air pollution which occurs from the transporting of goods by truck, by train and by ship.

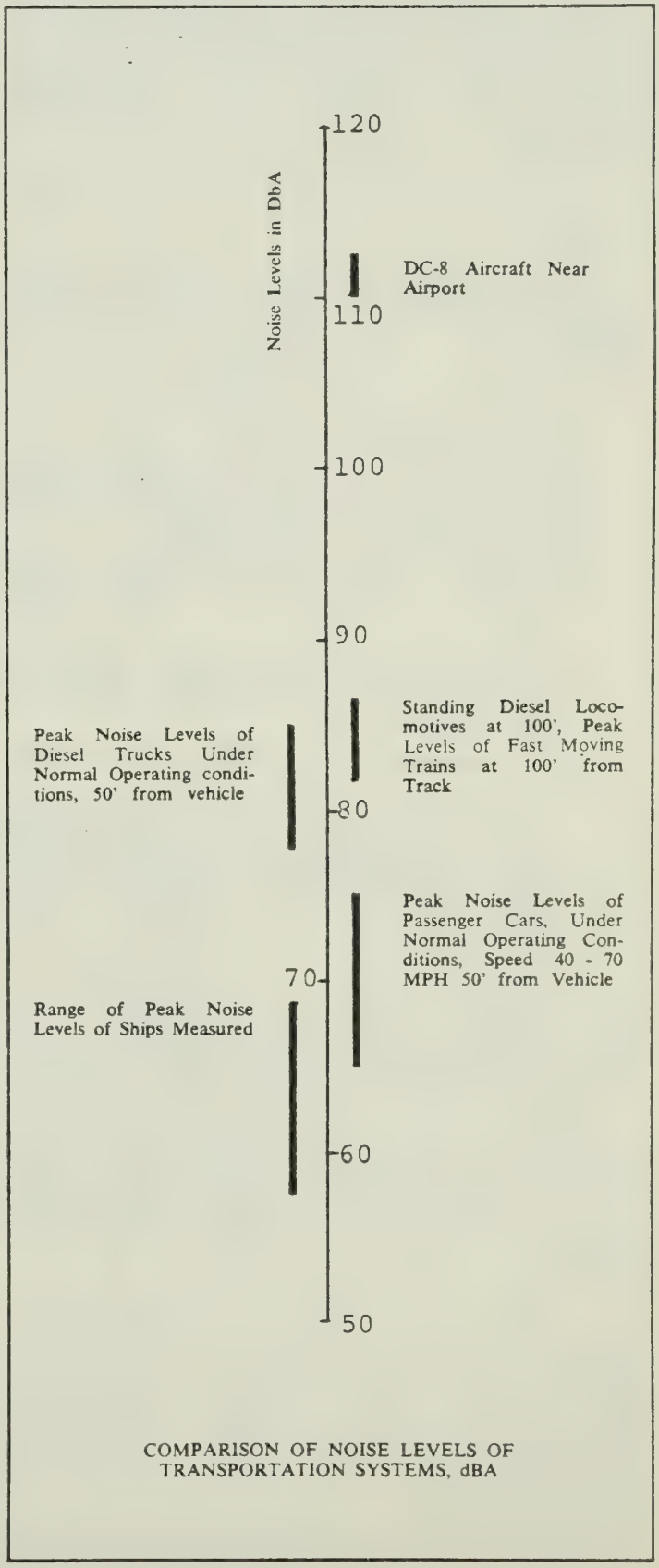
Before entering into a brief state-of-the-art summary of basic engineering criteria pertaining to noise and air pollution as related to transportation systems, I would like to quote from the 1971 Annual Report of the St. Lawrence Seaway Authority and the St. Lawrence Seaway Development Corporation which stated that the total cargo tonnage for the seaway system including the Welland Canal was 70.8 million tons, requiring 8,428 vessel transits. A record 52.9 million tons of cargo moved through the Montreal-Lake Ontario section of the seaway.

In recent years, the demand for transportation has soared. In the transportation areas where large technological investments have been made, Air and Highway, the technologies developed so far have too often ignored the environmental problems. The potential of jet and highway travel is marred by unacceptable levels of noise pollution and congestion. While railways contribute less sustained noise and air pollution to our environment than airplane jets and highway vehicles, *results of our studies show that the transporting of goods by ship produce by far the lowest overall effect on our environment when based on per ton mile of goods moved.*

While contemplating the preparation of this report, I became aware of the steady flow of traffic on the F. G. Gardiner Expressway outside my office, and was reminded of my previous employment with the Metropolitan Toronto Roads Department, where, for a period of fourteen years, I supervised the construction of the Don Valley Parkway and the F. G. Gardiner Expressway Systems.

It may be interesting to note that the F. G. Gardiner Expressway was completed in 1966, for a total expenditure of $104 million. The elevated centre sections required an expenditure of $17 million per mile. The proposed controversial Spadina Expressway is estimated to require $22 million per mile. When compared to the $583 million expenditure for the navigation portion (including the New Welland Bypass) of the St. Lawrence Seaway which opened up a marine highway extending over 2,000 miles, *these seaway costs represent the equivalent construction of about 29 miles of expressway for the same expenditure. Incidentally, none of the above mentioned expressways would ever be subjected to toll levies.*

Until recent years, the problem of noise received little public attention and aroused little public out-cry, except in isolated cases. With the growing public awareness of the environment, and a determination to improve it, noise and air pollution have aroused a great deal of concern and attention. In light of the environmental destruction and deterioration in recent decades, such concern is both understandable and desirable. For years, increasing noise levels have been considered undesirable but a necessary (and


Noise Levels in DbA
120
110
100
90
80
70
60
50
DC-8 Aircraft Near Airport
Standing Diesel Locomotives at 100', Peak Levels of Fast Moving Trains at 100' from Track
Peak Noise Levels of Diesel Trucks Under Normal Operating conditions, 50' from vehicle
Peak Noise Levels of Passenger Cars, Under Normal Operating Conditions, Speed 40 - 70 MPH 50' from Vehicle
Range of Peak Noise Levels of Ships Measured

COMPARISON OF NOISE LEVELS OF TRANSPORTATION SYSTEMS, dBA

therefore acceptable) by-product of increasing industrialization. Some of the most pervasive and intrusive noise sources are modern transportation systems.

The standard measure of noise (actually sound pressure level) is the decibel (db). In this report, we have adjusted the recorded noise levels to correspond to the A-weighted sound level values as used in engineering studies and transportation systems. (Ref. 1) These noise levels are expressed as DbA. This DbA value is a single number noise rating approximating the frequency response of the human ear.

Noise has been defined as "Undesirable or unwanted sounds".

Some of the effects of noise pollution on our present society were discussed at the Seminar held in Toronto on February 22, 1972, at which time Dr. Donald Allen stated the following:

a) The human body has no natural protection against noise; all it can do is "take it".

b) Constant exposure to noise levels of between 85 and 90 DbA can cause hearing impairment. Hearing impairment in this way is irrevocable.

c) The noise level at Yonge and King Streets in Toronto is now 83 DbA and will likely rise to 85 DbA.

d) Studies show that the noise level in the world as we know it has risen one decibel a year for the past 30 years.

e) The noise level in the average car is 70 decibels.

f) Noise levels within five or six blocks of a major highway are already too high for comfortable living and working. Experiments have shown that tobacco plants grown near a major highway had a growth rate that is 40% less than those grown in quieter surroundings.

Recent data on noise emissions (Ref. 1) indicate ranges of 78 to 85 DbA at fifty feet from diesel trucks, with other trucks and automobiles producing 65 to 75 DbA at a fifty foot distance. Standing diesel locomotives and moving freight trains produce 82 to 88 DbA at 100′ distances.

Perhaps our scientists have "missed the boat", because, published data on noise produced by ships was not available. This fact may be explained by the reported trend of public reaction to peak noises, which indicated public acceptance at 60 DbA, complaints at 70 DbA and severe protest at 80 DbA.

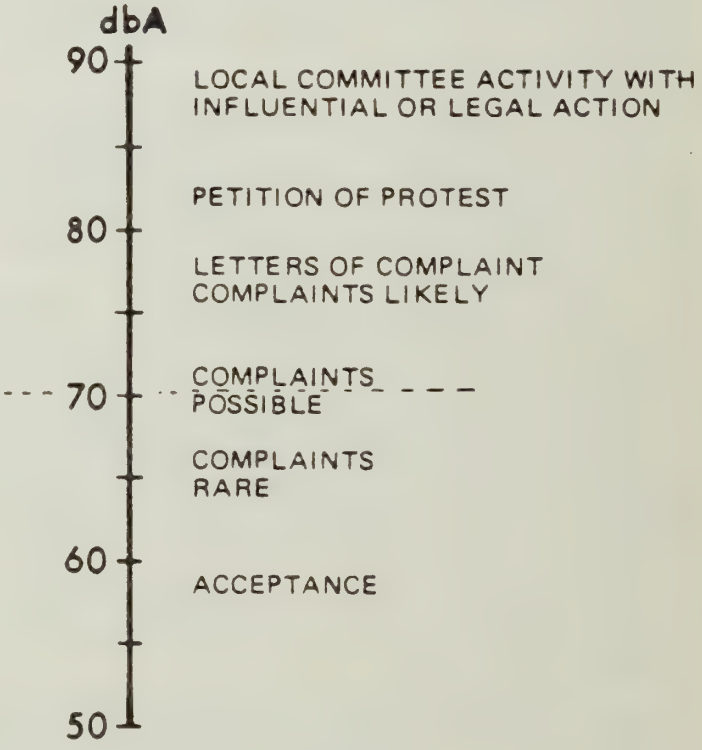
In order to obtain comparative results for ships, your engineering committee arranged for noise level readings to be taken alongside ships traversing the Welland Canal. Although residential developments have not occurred adjacent to the St. Lawrence Seaway Shipping Lanes, it was decided that readings, corresponding to criteria chosen for the other transportation systems, would produce meaningful and unbiased comparisons.

Recording instruments were stationed at a point 800′ east of Lock #3 and maximum readings were obtained on ships accelerating from the lock into Lake Ontario.

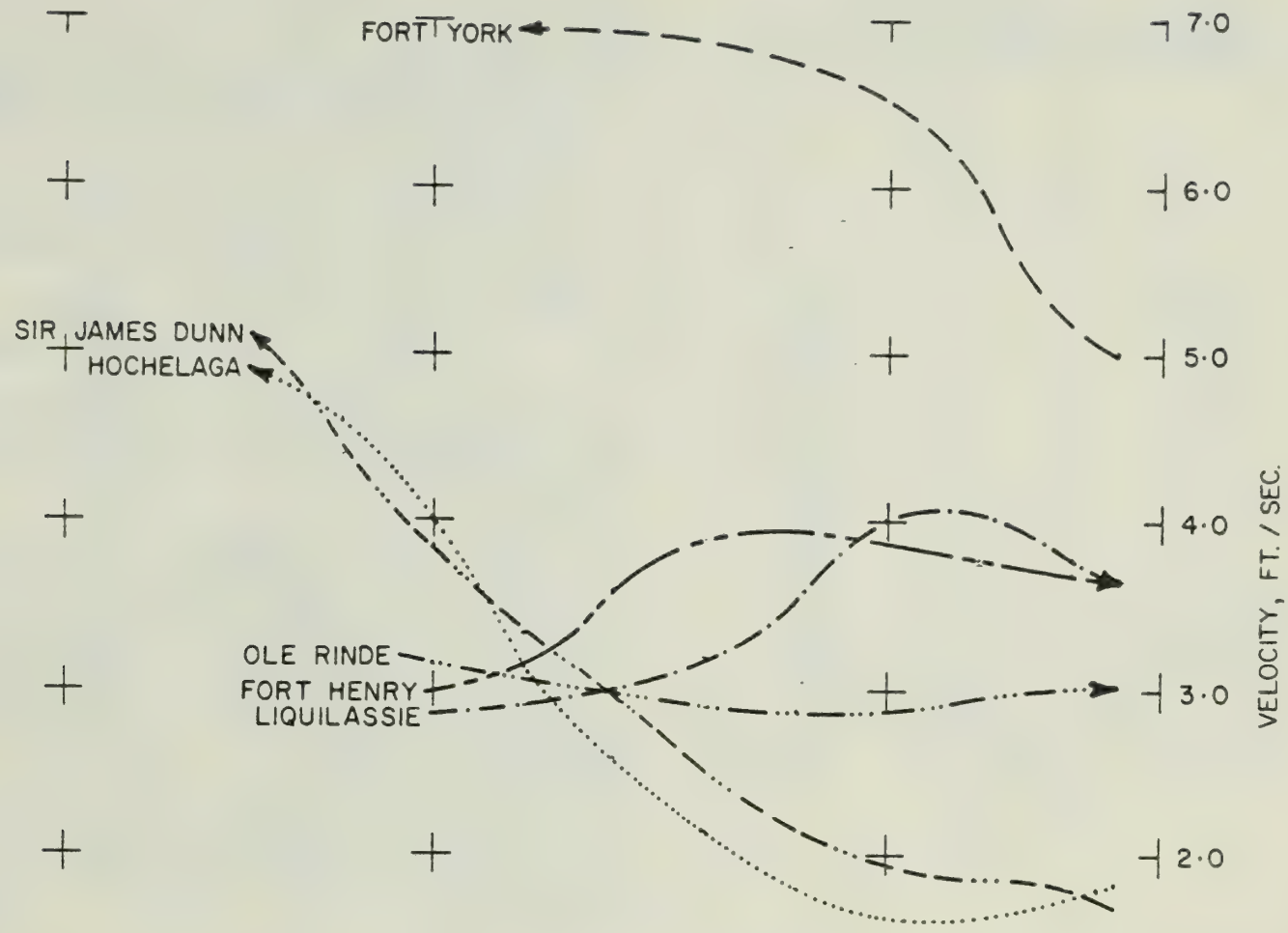
To use the table, select the column headed by the number of times the dangerous noise occurs each day, read down to the average sound level of the noise and locate directly to the left in the first column the total duration of dangerous noise allowed for any 24-hour period.

TOTAL NOISE DURATION PER 24-HR DAY	NUMBER OF TIMES NOISE OCCURS PER DAY						
	1	3	7	15	35	75	160 up
8 hrs.	89	89	89	89	89	89	89
6	90	92	95	97	96	94	93
4	91	94	98	101	103	101	99
2	93	98	102	105	108	113	117
1	96	102	106	109	114	125	125
30 min.	100	105	109	114	125		
15	104	109	115	124			
8	108	114	125				
4	113	125					A-weighted Sound Levels
2	123						

*** Acceptable Exposures to Dangerous Noise**



*** Trend of Public Reaction to Peak Noise near Residences**



VESSEL	LENGTH	DRAFT	FLAG	CARGO	MIKE. DIST.	VEL. @ BOL. 8
HOCHELAGA	640′	25′	CANADA	COAL	165′	3ft./sec.
OLE RINDE	365′	10′	NORWAY	BALLAST	111′	3 "
SIR JAMES DUNN	644′	23.5′	CANADA	ORE	140′	3.25 "
LIQUILASSIE	366′	15′	CANADA	BUNKER 'C'	30′	3 "
FORT YORK	462′	11′	CANADA	GENERAL	170′	7 "
FORT HENRY	462′	18.5′	CANADA	GENERAL	30′	3.25 "

Movement of Ships at Lock No. 3 Welland Canal — June 1, 1972

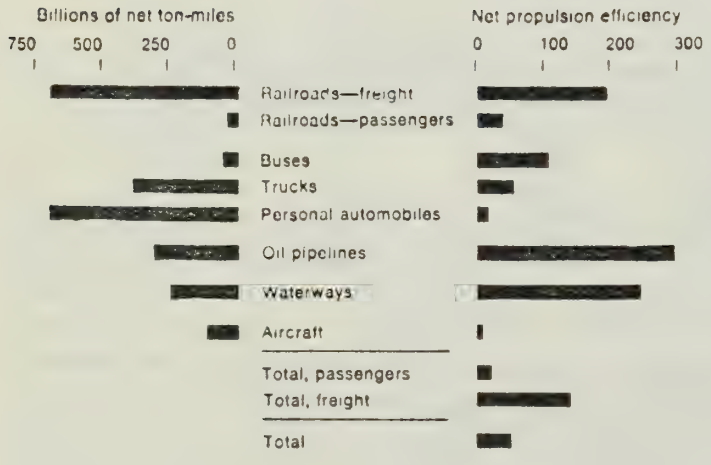
Name of Ship	No.	Measured Noise Levels		Tonnage Cargo	Distance to L. of Vessel	Speed
		dB (Linear)	dBA			
1	2	3	4	5	6	7
HOCHELAGA	1	79	58	16,700	165′	3
OLE RINDE	2	87	67	Ballast	111′	3
SIR JAMES DUNN	3	78	59	18,000	140′	3¼
MORANIA-160 Plus Tug	4	95	69	.....	25′	
LIQUILASSIE	5	77	64	5,400	30′	3
FORT YORK[2]	6	73	57	5,000	170′	7
FORT HENRY	7	80	66	5,000	30′	3¼

Peak noise levels of Moving Ships

NOTE: 1) Length of peak approximately 2 seconds.
2) Last two ships were passing each other at the position of microphone, Fort York being beyond.

Decibel Reduction	Reduction Experienced by Ear
2	15%
4	23%
6	38%
8	48%
10	56%
12	63%
14	68%
16	73%
18	77%
20	81%

* NOISE REDUCTION



Intercity transport of passengers and freight in the U.S. varies markedly in efficiency, as measured in terms of the net payload (pounds or individuals) carried per gallon of fuel consumed. It

Measured noise levels on three downbound ships and three upbound ships were as follows:

Downbound—Ships carrying cargoes of 18,000 tons of iron ore, 16,700 tons of coal and 5,000 tons of general cargo registered 59, 58 and 57 DbA at a 140′ distance from instrument to the centre line of ships.

Upbound—Ships carrying cargoes of 5,400 tons of fuel oil and 5,000 tons of general cargo registered 64 and 66 DbA at 30′ from instrument to centre line of vessels. A single vessel under ballast registered 67 DbA at 111′ from the instrument.

Maximum duration of peak noise was two seconds.

It is interesting to note that the noise readings varied inversely to the weight of cargo carried.

As a basis of comparison, (Ref. 1) a reduction of 10 DbA is approximately equal to a 50% noise reduction, and a reduction of 20 DbA is equal to 75% noise reduction as experienced by the human ear.

Peak noise levels produced by moving ships measured at the Welland Canal are comparable to the peak noise level produced by a passenger car travelling at a speed lower than 45 mph on dry pavement. When compared to the movement of goods by truck or train, a ship carrying either 18,000 tons of iron ore or 5,000 tons of general cargo produced peak noises that are 75% lower than those produced by a truck operating under normal conditions or by a standing diesel locomotive.

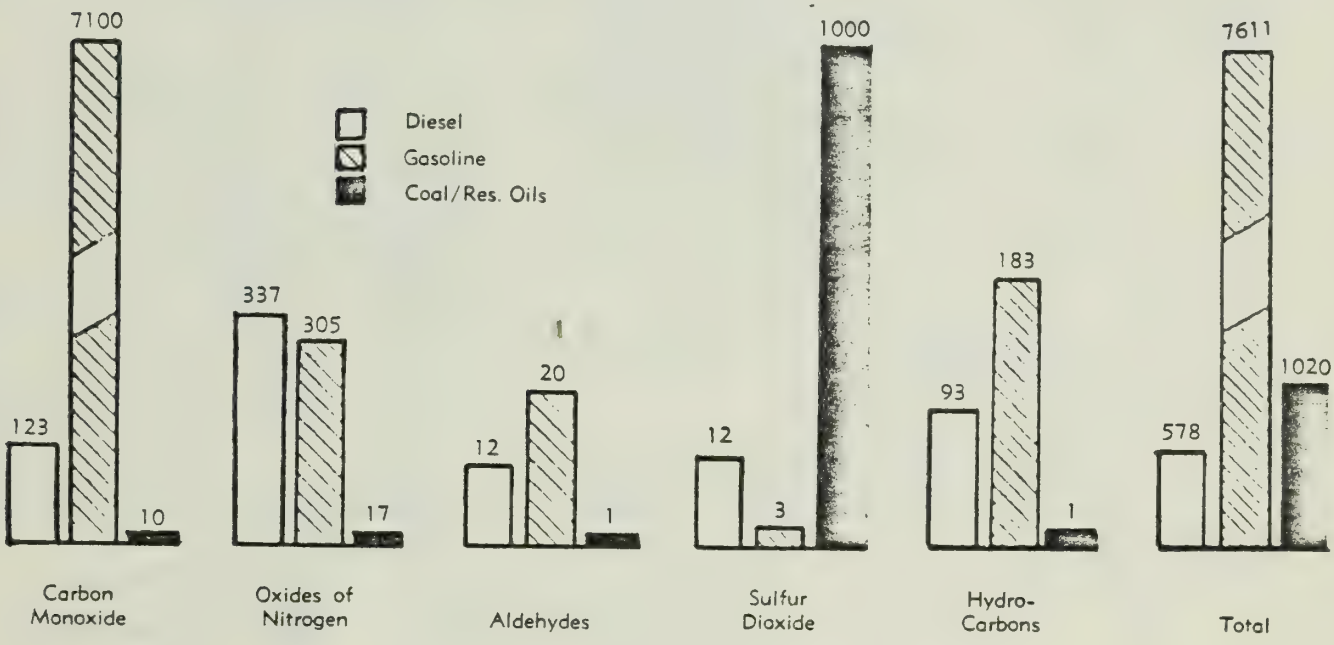
At this moment, in an attempt to bring noise relief to owners of homes located adjacent to the Don Valley Parkway, the Metropolitan Toronto Roads and Traffic Department is erecting proto-type sound walls, twelve feet in height, extending up to a mile in length at expenditures averaging $185,000 per mile.

The Department of Finance of the Government of Canada, (Ref. 4) in their publication "Transportation 1980", have indicated that the present seaway capacity limits are upwards of 110,000,000 tons per year.

When we consider that to transport 50,000,000 tons of cargo by truck on the present highway systems would create a steady 85 DbA reading 24 hours per day for periods up to 300 days each year, and by train a minimum reading of 85 DbA extending over 3 minutes each half hour for 200 days of the year, is it not "Just Common Sense" to use the seaway to move the maximum tonnage possible to the closest inland terminal port before trans-shipping to other modes of transportation?

It has been stated that modes of transportation (Ref. 6) account for more than half of the 174 billion gallons of petroleum consumed in the United States. At a time when the overall energy supply and demand system is coming under ever-sharper scrutiny, it is wise to compare the consumption of fuel and subsequent pollution emission on a ton mile per gallon basis, relative to the shipment of goods by either truck, train or ship. If and when absolute fuel consumption becomes a primary issue in the transportation field, engineers will discover how extravagant are today's exotic forms of transport. *Air freight transport yields up to ten cargo ton miles per gallon, trucks achieve fifty-four ton miles per gallon, and railway freight 193 ton miles per gallon. At present, ships operating on the St. Lawrence Seaway obtain from 247 to 1,050 ton miles per gallon, depending on the type of cargo being transported, general cargo being the lowest and bulk such as iron ore being the highest.*

The comparative emissions of major pollutants from railway diesels, gasoline-engines, and stationary power plants are shown in Figure 1.



*Estimated emissions of pollutant in cu. ft./1000 lb. fuel.

Research produced by the Canadian National Railways (Ref. 3) has shown that 1,000 lbs. of diesel fuel produces 578 cubic feet of major pollutants, composed of carbon-monoxide — 123 cubic feet, oxides of nitrogen — 337 cubic feet, aldehydes — 12 cubic feet, sulphur dioxide — 12 cubic feet and hydro-carbons—93 cubic feet. A comparison of the emissions produced by railroad freight, diesel trucks and ships resulting from the transporting of one million tons of cargo show that 7,440,000 cubic feet of emissions would be produced by freight trains, 26,500,000 cubic feet by diesel trucks and only 5,600,000 cubic feet by ships. *These results show that ships produce 33% less pollutants than diesel trains and 373% less than diesel trucks, when compared on a basis of ton miles per gallon of fuel consumed.*

This report would not be complete without mentioning the incidents of oil spills within a port's jurisdiction. In this case, the Port of Toronto. Records over the last five years indicate that in a single year, an average of eighteen oil spills have occurred within the harbour. Sources of these spills have been:

Industrial Plants	6
Ships	5
Storm Sewers	3
Unknown Origin	4

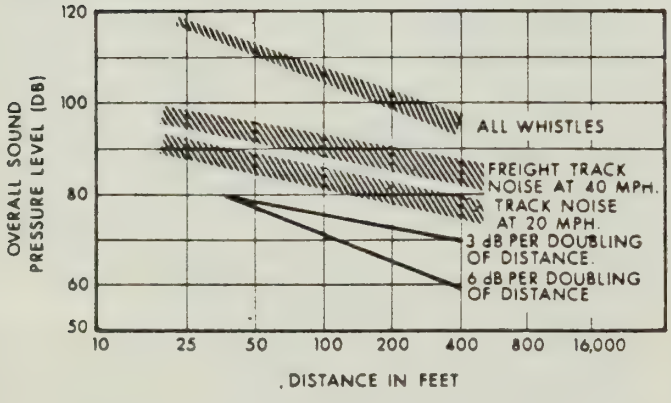
All of the oil spills from vessels over the last five years have been of a minor nature, and though it is extremely difficult to estimate the quantities involved, *a fair average would be fifty gallons spilled from each ship.*

In all areas of oil pollution, ships are the most heavily policed. In the Port of Toronto (in season), the Department of Transport, the Toronto Harbour Police, the Toronto Port Police and Engineering Surveys do daily inspections. In addition, weekly aerial inspections are sponsored by the Toronto Harbour Commissioners. It seems that, when any member of the public sees oil in the harbour area, they are inclined to blame the spill on ships. This, I feel, is a natural reaction, but incorrect. If industry and sewer outlets were inspected to the same degree as ships, our number of unknown spills would be minimal.

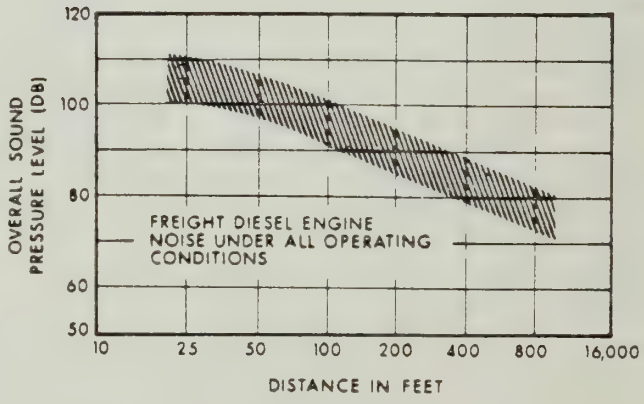
When oil is suspected to be from a ship, the Steamship Inspection Branch of the Department of Transport is called in. Inspectors from this division have the authority to completely inspect the vessel and to delay the ship if required, pending further investigations. Generally speaking, the quantities involved from spills originating at industrial plants have been larger than from ships. In February, 1969, a leak from an oil pipeline allowed approximately 14,000 gallons of fuel oil to escape into the harbour. All parties involved cooperated fully to facilitate removal of the oil.

* Table 19, Typical Noise Levels Produced by Rail Transportation Systems

INVESTIGATOR OR REPORTER	SYSTEM	INTERNAL NOISE LEVELS		EXTERNAL NOISE LEVELS		
DAVIS [46] (ALL SUBWAYS)	PHILADELPHIA	AT 30 MPH	103 PHONS = 98 db; VIBRATION 'HIGH'			
	BOSTON	AT 30 MPH 45-50 MPH	97 PHONS = 95 db; VIBRATION 'HIGH' 90 PHONS = 86 db.			
	NEW YORK	AT 30 MPH	98 PHONS = 94 db. VIBRATION 'MEDIUM'	STATION PLATFORM	103-108 PHONS = 98-100 db	
	CHICAGO	AT 30 MPH	98 PHONS = 92 db; VIBRATION 'LOW'	STATION PLATFORM	99-106 PHONS = 92-100 db	
	LONDON	AT 30 MPH 45-50 MPH	93 PHONS = 87 db; VIBRATION 'MEDIUM' 91 PHONS = 86 db.			
	BERLIN	AT 30 MPH AT 40 MPH	85 PHONS = 86 db; VIBRATION 'LOW' 91 PHONS = 86 db	STATION PLATFORM	92-98 PHONS = 88-94 db	
	HAMBURG	AT 30 MPH	87 PHONS = 80 db. VIBRATION 'LOW'	STATION PLATFORM	95-105 PHONS = 88-97 db	
	PARIS (RUBBER)	AT 30 MPH	89 PHONS = 86 db; VIBRATION 'MEDIUM'	STATION PLATFORM	93-101 PHONS = 88-96 db	
	TORONTO	AT 30 MPH 45-50 MPH	90 PHONS = 85 db. VIBRATION 'LOW' 90 PHONS = 86 db	STATION PLATFORM INSIDE ADJACENT HOUSES [47]	93-94 PHONS = 87 db UP TO 64 db	
				25 Ft.	50 Ft.	75 Ft.
LORD [16]	TORONTO	40 MPH	78 dbA	84 dbA	79 dbA	76 dbA
	BRITISH RAIL SUBURBAN TRAIN	40 MPH	71 dbA	88 dbA	83 dbA	78 dbA
	LONDON TRANSPORT METRO LINE	40 MPH	78 dbA IN OPEN, 82 dbA IN TUNNEL	87 dbA	–	–
	ARWEG MONORAIL	40 MPH	81 dbA	80 dbA	75 dbA	68 dbA
	SAFEGE MONORAIL	40 MPH	68 dbA	84 dbA	78 dbA	76 dbA
EMBLETON AND THIESSEN [48]	FREIGHT TRAINS NEAR OTTAWA, ONTARIO			DIESEL ENGINE	25 FT. 100 FT. 800 FT.	100-110 db 88-100 db 74-84 db (See Figure 20)
				TRACK NOISE 40 MPH	25 FT. 100 FT. 800 FT.	95-98 db 89-93 db (See Figure 21) 79-83 db
				WHISTLES	25 FT. 100 FT. 400 FT.	116 db (See Figure 21) 104-107 db 92-97 db
		INSIDE	OUTSIDE			
BOTSFORD [18]	PHILADELPHIA SUBWAY	BELOW GROUND 82-95 dbA ABOVE GROUND 78-90 dbA	BOARDING PLATFORM BELOW GROUND 93-98 dbA ABOVE GROUND 83-93 dbA			



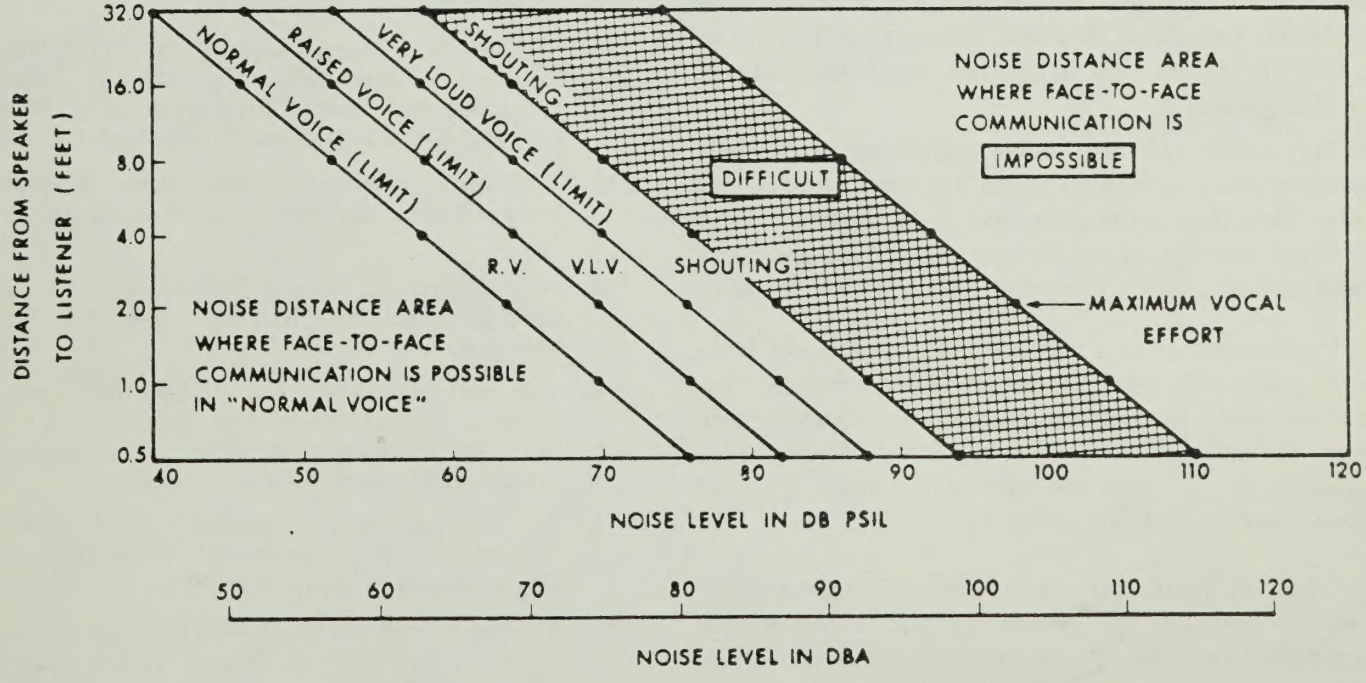
* Figure 21, Over-all Sound Pressure Levels versus Distance for Freight Train Track Noise and Whistle Noises



* Figure 20, Over-all Sound Pressure Levels versus Distance for Freight Diesel Engines

* Table 13, Typical Noise Levels Produced by Motor Vehicles

INVESTIGATOR OR REPORTER	AUTOS	TRUCKS	BUSSES	MOTORCYCLES
Thiessen and Olson [40]	At 15 meters, cruising speed, 50 -70 mph L_{10} = 74 - 75 dbA L_{50} = 72 - 73 dbA	At 15 meters cruising speed, 50 - 70 mph Dump Trucks: L_{10} = 84 dbA L_{50} = 82 dbA Tractor-Trailers: L_{10} = 89 dbA L_{50} = 86 dbA	L_{10} = 85 - 88 dbA	84 - 95 dbA
Venema [11]	At 15', cruising speed, 60 mph Range = 66 - 72 dbA At 15', full throttle, 60 mph Range = 75 - 91 dbA			
Botsford [18]		At operator's ear: 81 - 92 dbA	At operator's ear: 82 - 96 dbA	
British Building Research Station (Burns [6])	Motorway noise, 30' L_{10} = 80 dbA			
Beaton and Bourget [29]	At 25', edge of pavement Range = 69 - 90 dbA L_{10} = 84 dbA L_{50} = 80 dbA	At 25' from edge of pavement Gasoline powered Range = 75 - 95 dbA L_{10} = 90 dbA L_{50} = 84 dbA Diesel powered Range = 82 - 105 dbA L_{10} = 96 dbA L_{50} = 92 dbA		



*** Speech Interference by Noise**

Emergency procedures have been set up by all oil companies in the harbour area in cooperation with The Toronto Harbour Commissioners' Works Division. Inspection of industry is handled by the Metro Industrial Waste Control Branch, along with the Ministry of The Environment. To cover the possibility of spills after hours and on weekends, a central communication network has been initiated by The Toronto Harbour Commissioners. It must also be pointed out that some of the larger companies have now appointed pollution control officers, and it is their responsibility to work very closely with all the authorities involved. Oil spills from various Municipal sewer outlets in the harbour area seem to be harder to control than any type of spill. This, I feel, is due to several reasons:

(a) Sudden rain storms flush any offending material into the harbour, causing the oil to be dispersed over wide areas.

(b) Seepage through the ground (from industry) is extremely difficult to control, and may lie in the sewer system until flushed out by rain storms.

(c) Removal of oil or other contaminants from the sewer system by pumping is never 100% effective.

(d) Some of the City sewer systems in the harbour area are very old, and over the years, improper connections from industry have allowed oil to drain into the storm sewer systems.

Inspection of all sewer systems is handled by either the City of Toronto (Operations) or the Metro Industrial Waste Control Branch, along with assistance from the Ministry of The Environment. Unfortunately, when a spill from a sewer is being investigated, matters have been further complicated by having to determine if the sewer involved is under the jurisdiction of either Metropolitan Toronto or the City of Toronto. In many cases jurisdiction has not been clearly resolved.

Fortunately, over the last five years, none of the spills originating from unknown sources has been of a serious nature. Nevertheless, the spills have to be cleaned up and time spent investigating the incident. All spills are documented and information is readily available when required.

In summation, our experience with oil spillages from ships has shown that the quantities have been minimal, that immediate action by experienced crews can effectively contain the oil and *that vessels within the Port of Toronto were responsible for less than one third of the minor oil spills recorded over the last five years.*

When we recall that our forefathers dreamed of an inland waterway and that our leading contemporaries constructed the seaway; let us ensure that our countries reap the benefits to our environment which this Marine Highway can give, namely, the quiet and efficient movement of cargo throughout its entire length.

*** Table 5, Speech Interference Levels of Noise that just Permit Conversation with Marginal Reliability at the Distances and Voice Levels Indicated [6]**

DISTANCE FROM LISTENER (FT.)	SPEECH INTERFERENCE LEVEL (PSIL) IN DB*			
	NORMAL VOICE	RAISED VOICE	VERY LOUD VOICE	SHOUTING
0.5	76	82	88	94
1	70	76	82	88
2	64	70	76	82
3	60	66	72	78
4	58	64	70	76
5	56	62	68	74
6	54	60	66	72
12	48	54	60	66

* *Average SPL in db of noise in the octave bands centred at 500, 1,000 and 2,000 Hz. (PSIL) Sound levels in dbA are 7 db greater than PSIL db.*

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